

IN THE CLAIMS:

Please cancel Claims 1 to 36 without prejudice or disclaimer of subject matter. Please amend Claim 59 as shown below. The claims, as pending in the subject application, read as follows:

1. to 36. (Cancelled)

37. (Original) A plasma processing apparatus comprising a container, a gas supply port for supplying a processing gas into the container, and a microwave applicator for supplying microwaves into the container through a dielectric window, the microwave applicator comprising an endless circular waveguide having a plurality of slots provided at a predetermined interval in a plane thereof in contact with the dielectric window, wherein the centers of the slots are on a circle having a radius r_c approximately represented by

$$r_c = n_1 \lambda_s / \{2 \tan(\pi / (2n_g))\} \{1 + \cos(\pi / n_g)\}$$

wherein n_1 is the number of antinodes of surface standing waves generated between the slots, λ_s is the wavelength of surface waves, n_g is the ratio of the circumferential length l_g of the circular waveguide to the guide wavelength λ_g .

38. (Original) The plasma processing apparatus according to Claim 37, wherein the value of n_g is within the range of 2 to 5.

39. (Original) The plasma processing apparatus according to Claim 37, wherein the angular spacing of the slots is represented by π/n_g .

40. (Original) The plasma processing apparatus according to Claim 37, wherein the number n_l of antinodes of surface standing waves generated between the slots is any one of 3, 5 or 7.

41. (Original) The plasma processing apparatus according to Claim 37, wherein the dielectric window comprises aluminium nitride as a main component.

42. (Original) A plasma processing method comprising the steps of placing an article in a container with a microwave transmissive dielectric window; evacuating the container; introducing a processing gas into the container; and supplying microwaves into the container through an endless circular waveguide having a plurality of slots provided by perforation at a predetermined interval in a plane thereof in contact with the dielectric window and configured such that the centers of the slots are on a circle having a radius r_c approximately represented by

$$r_c = n_l \lambda_s / \{2 \tan(\pi / (2n_g))\} \{1 + \cos(\pi / n_g)\}$$

wherein n_l is the number of antinodes of surface standing waves generated between the slots, λ_s is the wavelength of surface waves, n_g is the ratio of the circumferential length l_g of the circular waveguide to the guide wavelength λ_g , thereby generating a plasma in the container.

43. (Original) The plasma processing method according to Claim 42, which effects film formation on the article by the chemical vapor deposition.

44. (Original) The plasma processing method according to Claim 42, which effects etching of the article.

45. (Original) The plasma processing method according to Claim 42, which effects ashing of the article.

46. (Original) The plasma processing method according to Claim 42, which effects doping of the article.

47. (Original) A plasma processing apparatus comprising an internally evacuable container and a gas supply port for supplying a processing gas into the container, for plasma processing an article arranged in the container, further comprising means for supplying a microwave energy for generating a plasma of the gas in the container, the means comprising an endless circular waveguide having a plurality of slots provided at a predetermined interval in a plane on the dielectric window side thereof, wherein the centers of the plurality of slots are offset in a direction parallel to the plane with respect to the center of the circular waveguide such that the centers of the slots are on a circle having a radius r_c approximately represented by

$$r_c = n_1 \lambda_s / \{2 \tan(\pi / (2n_g))\} \{1 + \cos(\pi / n_g)\}$$

wherein n_1 is the number of antinodes of surface standing waves generated between the slots, λ_s is the wavelength of surface waves, n_g is the ratio of the circumferential length l_g of the circular waveguide to the guide wavelength λ_g .

48. (Original) The plasma processing apparatus according to Claim 47, wherein the value of n_g is within the range of 2 to 5.

49. (Original) The plasma processing apparatus according to Claim 47, wherein the angular spacing of the slots is represented by π/n_g .

50. (Original) The plasma processing apparatus according to Claim 47, wherein the number n_1 of antinodes of surface standing waves generated between the slots is any one of 3, 5 or 7.

51. (Original) The plasma processing apparatus according to Claim 47, wherein the dielectric window comprises aluminium nitride as a main component.

52. (Original) A plasma processing method of plasma processing an article, comprising using the plasma processing apparatus as set forth in Claim 47 to plasma process the article.

53. (Original) The plasma processing method according to Claim 52, which is at least one of ashing, etching, cleaning, CVD, plasma polymerization, doping, oxidation and nitridation.

54. (Original) The plasma processing method according to Claim 52, comprising ashing a 200 mm wafer with the circumferential length of the circular waveguide being 3 times the guide wavelength of microwaves.

55. (Original) The plasma processing apparatus according to Claim 47, wherein the gas supply port is provided in a side wall of the container.

56. (Original) The plasma processing apparatus according to Claim 47, wherein the gas supply port is provided nearer to the plane provided with the plurality of slots than to the article.

57. (Original) The plasma processing apparatus according to Claim 47, wherein the processing gas is emitted from the gas supply port to the plane provided with the plurality of slots.

58. (Original) The plasma processing apparatus according to Claim 47, wherein the container is provided with an exhaust pump that reduces the pressure inside the container to 1.34×10^3 Pa or less.

59. (Currently Amended) A method of producing a structure,
comprising the step of using the plasma processing apparatus as set forth in Claim ~~19~~ or 47
to plasma process the article.